



**Volcaniclastic rocks (Oligocene)**—Brownish-gray to purplish-gray, thin-bedded, coarse-grained, cross-bedded sandstone containing angular andesite clasts that are slightly altered to clay. Matrix is composed of fine-grained sandstone, which is altered into bouldery conglomerate. Discontinuous unit is up to 50 (15 m) thick.

**Air-fall tuff member**—Pale-red, poorly bedded, devitrified, crystal-poor, air-fall tuff. Small, largely conchoidal outcrops along the southern side of Rimrock are up to 20 (6 m) thick.

**Dacite of Summit Mountain (Oligocene)**—Medium-gray to grayish-purple to black, bedded, porphyritic dacite with 10 to 20 percent phenocrysts as much as 4 mm in size. Rhyolite. Dacite flows contain 15 to 40 percent phenocrysts as much as 4 mm in size. Phenocrysts include 10-33 percent andesine ( $An_{40-50}$ ), 15 percent plagioclase, and 1 to 10 percent quartz, biotite, hornblende, and clinopyroxene, all as euhedral, angular, and subhedral grains. Some grains are altered to albite, calcite, white mica, quartz, and iron oxides. In the vicinity of Gump Camp the dacite rhyolites are locally argillized and sericitized (silepctolized pattern); gypsium is common in the dacite. Chemical analyses of the dacite are present in the more simplified dacite. The chemical analyses of the dacite porphyry indicate a silica content of 60.0, 62.1, and 64.3 percent (table 1). Unit is repeated by faulting and is 100 to 150 (50 m) thick.

**Upper sandstone member**—Light-brown, very thin bedded, fine to medium-grained sandstone with thin pebbles conglomerate lenses. Abundant angular sandstone clasts are up to 10 (5 m) thick.

**Tuff member**—Very light yellowish gray, nonbedded, devitrified, air-fall tuff. Discontinuous but generally less than 20 (6 m) thick.

**Silicified rhyolite member**—Thin bedded, gray to black silicified rock that occurs as lens-like bodies within the dacite porphyry. Fragmental texture and brecciated bedding common. Sparse argillized phenocrysts and dots of ferric oxide partly pseudomorphs after biotite. Maximum thickness about 30 (15 m).

**Middle sandstone member**—Greenish-gray to yellowish-green, thin bedded, medium to coarse-grained sandstone with abundant sandstone clasts of angular sandstone grains. Sedimentary breccias are locally present. Maximum thickness about 20 (6 m).

**Lower sandstone member**—Light-brown, thin bedded, coarse-grained sandstone and sedimentary breccia. Rhyolite fragments 10-20 cm across are present in the lower part of the unit. Maximum exposed thickness about 30 (15 m).

Biggerstaff, B.P., 1974. Geology and ore deposits of the Strepck Rock-Twin Peaks area, Grant County, New Mexico. El Paso, University of Texas, M.S. thesis, 102 p.

Meeves, H.C. 1966. Nonpegmatitic beryllium occurrences in Arizona, Colorado, New Mexico, Utah and four adjacent states: U.S. Bureau of Mines Report of Investigations 6818, 68 p.

Powers, R.L., 1974. Geology of the Summit Mountains and vicinity, Grant County, New Mexico, and Greenlee County, Arizona. Houston, University of Houston, M.S. thesis, 107 p.

Ratté, J.J., and Gaskill, D.L., 1975. Reconnaissance geologic map of the Gila Wilderness Study Area, southwestern New Mexico: U.S. Geological Survey Miscellaneous Investigation Series map I-886, scale 1:62,500.

Trace, R., and The Four Corners and Luckie No. 1 and No 2 fluorapatite veins, Greenlee County, Arizona: U.S. Geological Survey Strategic Minerals Investigations Preliminary Report 3-207, 6 p.

[N = not determined; \* total iron reported as  $\text{Fe}_2\text{O}_3$ ; (LOI) = loss on ignition - 900 °C. Analyses by X-ray spectroscopy and single solution methods by P. Briggs (1980); A.J. Bartel, K. Stewart, and J. Taggart (1983)]

Rock type----- Map symbol- Field No. -----	Dacite porphyry Tds YV-44.83	Basaltic andesite Tds YV-45.83	Dacite porphyry Tds YV-46.83	Dacite Tds YV-49	Basalt Tds YV-54.79
SiO <sub>2</sub>	60.0	54.1	62.1	64.3	46.9
Al <sub>2</sub> O <sub>3</sub>	16.8	15.1	15.6	N	N
Fe <sub>2</sub> O <sub>3</sub>	4.53	*7.71	*5.08	N	N
MgO	5.19	3.36	2.03	N	N
CaO	3.65	3.95	2.11	N	N
Na <sub>2</sub> O	3.81	3.56	2.86	3.5	3.1
K <sub>2</sub> O	3.49	3.42	4.07	2.4	2.5
TiO <sub>2</sub>	6.3	1.30	.64	N	N
P <sub>2</sub> O <sub>5</sub>	17	.56	.18	N	N
MnO	.07	.11	.05	N	N
(LOI)	3.29	5.72	4.32	N	N
Total	99	99	70	70.2	52.5

Sample YV-44-83: Dacite of Summit Mountain  
Location - Road cut near Luckie No. 2 mine; SE1/4NW1/4 sec. 10, T. 7 S., R. 32 E., Arizona.

Sample YV-45-83: Basaltic andesite of Darker Thunder Canyon  
Location - Road cut 600 ft SW of Daniels Camp mine; SW1/4NE1/4 sec. 5, T. 7 S., R. 32 E. Arizona.

Sample YV-46-83: Dacite of Summit Mountain  
Location - 1,000 ft east of Daniels Camp mine; NE1/4NE1/4 sec. 5, T. 7 S., R. 32 E., Arizona.

Sample YV-33-79: Dacite of Summit Mountain  
Location - 1,000 ft east of Daniels Camp mine; NE1/4SE1/4NW1/4 sec. 9, T. 17 S., R. 21 W., Arizona.

Sample YV-34-79: Basalt of Darker Thunder Canyon  
Location - NE1/4NE1/4 sec. 5, T. 17 S., R. 21 W., New Mexico.

Table 2.—Mines, prospects, and mineral occurrences in the Goat Camp Spring quadrangle, Arizona and New Mexico

Map No.	Name	Sec.	Location T	R	Description	Development	Reference	
Fluorapatite deposits								
1	Black Cat	NW1/4	33	65	32E	Brecciated fault that strikes N. 15° E. and 80° E., contains abundant crossiteiferous manganese oxides and minor amounts of fluorite.	Trench about 46 m (150 ft) by 1.5 m (5 ft).	— p. 80-82.
2	Daniel Camp	NE1/4	5	75	32E	Colcolite fluorite, small calcite, barite, and minor manganese oxides as fracturing along fault that strikes N. 12° E. and N. 5° W. Vein up to 15 m (49 ft) long and 1 m (3.3 ft) thick.	Shaft, prospect pits.	B.P. Biggaroff (1970), p. 80-82.
3	Fourth of July group	SE1/4, SW1/4	4	75	32E	Colcolite and pale-green fluorite along N. 35-45° W. fractures. Abundant crossite, calcite, minor manganese oxides, and sparse quartz. Mevesen (1960) reported traces (0.01 percent BeC) of beryl.	Two shafts and numerous prospect pits along Fourth of July fault.	R.D. Trace (1974), p. 6. H.C. Meeres (1966), p. 58. R.C. Powers (1966), p. 77.
4	Forbis (Flys Am)	NE1/4, SW1/4	9	75	32E	Colcolite and green fluorite vein up to 2 m (6.6 ft) wide and 20 m (66 ft) long along fault that strikes N. 15° W.	Shaft and trench. Past production probably less than 50 short tons.	—
5	Lucky No. 1	SW1/4, SE1/4	3	75	32E	Brecciated margins of rhypolite dike contain colcolite to pale-purple fluorite and manganese oxides as fracturing. Other minerals are pyrite, chrysotile, and very pale anthophyllite quartz. Brecciated vein strikes N. 15° E. and can be traced for about 20 m (66 ft). Mevesen (1960) reported traces of beryl (0.01 percent BeC).	Shaft, trench, and prospect pits.	R.D. Trace (1974), p. 6. H.C. Meeres (1966), p. 58.
6	Lucky No. 2	NW1/4	10	75	32E	Crossiteiferous, colcolite, pale-green and pale-yellow fluorite along fault that strikes 40° E. Ore is very rough. Mevesen (1960) reported traces of beryl (0.01 percent BeC).	Two shafts.	R.D. Trace (1974), p. 6. H.C. Meeres (1966), p. 58.
7	Dean	NW1/4	15	75	32E	Colcolite and pale-green fluorite along brecciated fractures on vein side of rhypolite dike. Dike and fractures strike N. 10° W.	Shaft and trench. Past production estimated as about 100 short tons.	—
8	Ontario	NE1/4	15	75	32E	Colcolite and pale-green fluorite along fault that strikes N. 5°-10° E. Vein is up to 150 m (492 ft) long and 1 m (3.3 ft) wide.	Shaft, trenches, and prospect pits.	—
9	Stuts	NE1/4	15	75	32E	Colcolite and pale-green fluorite along silicified veins that strikes N. 0°-5° E.	Trenches, prospect pits.	—
10	—	NE1/4	30	175	21W	Colcolite fluorite along thin fractures that strike N. 90°-95° E.	Caved shaft and prospect pit.	—
11	Rathsknecht No. 1	NE1/4	29	175	21W	Green fluorite vein up to 15 m (49 ft) long and 0.6 m (2 ft) wide strikes N. 2°-5° W. and dips 40° E.	Trench.	—
12	Rathsknecht No. 2	SW1/4	20	175	21W	Green fluorite vein that is very poorly exposed, strikes N. 15° W. and dips. Vein is probably less than 20 cm (8 in.) thick or outcrop.	Shaft, trench, and prospect pits. No. 1 and No. 2 mines probably had a combined production of 100 to 150 short tons.	—
Alumite deposits								
13	"Alumite of Goat Camp Springs"	15 18 NW1/4, NW1/4	15 18 16 18	32E 21W 175 21W	Highly kaolinized and locally silicified alumite (poorly and rhyolitic).	None	—	

This map is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

109°15'		109°00'	108°45'
	TELE TALL PEAK	CROOKSON PEAK	APPLE MOUNTAIN
	GOAT CAMP SPRING	STEER PEAK	WALKER CANYON
	DUNCAN		32°45'
			CANADON PEAK
			NICHOLS CANYON
		ROCK TAW DRAW	CUPCROCK MOUNTAIN
			32°00'